

Application No.: 10/786206

Case No.: 59541US002

REMARKS

Claims 1, 2, 5-7, and 10 to 30 are pending. Claims 3, 4, 8 and 9 have been canceled. Claims 23 to 29 have been withdrawn from consideration. Claims 1 and 5 are amended. Claim 1 is amended to include the limitations of claim 4. Claim 5 is amended to properly depend from amended claim 1. Claim 30 has been added.

Brief Statement of the Invention

The present invention is directed to a hydrophilic article having a thermoplastic polymer layer, and an adhesive layer containing a surfactant. The thermoplastic polymer layer is initially hydrophobic, but is rendered hydrophilic by migration of the surfactant through the matrix of the thermoplastic polymer, to the exposed surface. The present invention solves the problem of the art by providing a reservoir for surfactants in an adhesive layer to provide hydrophilicity over a period of time.

Use of an "adhesive reservoir" for surfactants eliminates problems that occur in the two most common methods used for providing a hydrophilic surface to into thermoplastic polymers: extrusion and coating. Surfactants frequently cannot be directly compounded and extruded as a melt because of the low decomposition temperatures of the surfactants. In other cases, the surfactants may interfere with polymer nucleation, or may degrade the physical properties of the thermoplastic polymer during processing. Coating methods to provide a hydrophilic surface also have limitations. First of all, the extra step required in film preparation is expensive, time consuming and involves safety and environmental issues. Many of the solvents used for coating are flammable liquids or have exposure limits that require special production facilities. Furthermore the quantity of surfactant is limited by the solubility in the coating solvent and the thickness of the coating. Again, incorporation of surfactants into the adhesive can solve these problems.

§ 102 Rejections

Claims 1-3, 13-15 and 21 were rejected under 35 USC § 102(b) as being anticipated by, or in the alternative, under 35 USC § 103(a) as obvious over U.S. 5,532,300 (Koubek et al.) as evidenced by U.S. 6,489,387 (Mallya et al.).

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The rejection is rendered moot by amendments to claim 1, in particular, the incorporation of the limitations of claim 4. Withdrawal of the rejection is respectfully requested.

Claims 1, 16, 17, 19 and 20 were rejected under 35 USC § 102(b) as being anticipated by, or in the alternative, under 35 USC § 103(a) as obvious over U.S. 6,503,620 (Xie et al.) as evidenced by U.S. 6,489,387 (Mallya et al.).

The rejection is rendered moot by amendments to claim 1, in particular, the incorporation of the limitations of claim 4. Withdrawal of the rejection is respectfully requested.

§ 103 Rejections

Claims 5-7 and 10-12 stand rejected under 35 USC § 103(a) as being unpatentable over U.S. 5,532,300 (Koubek et al.) in view of U.S. 5,804,625 (Temperante et al.) The rejection is traversed. Rejected claim 4 has been cancelled and the limitations incorporated into claim 1.

Koubek et al. is directed to a water-borne, water-redispersible adhesives, notably styrene/acrylic acid copolymers, prepared by emulsion polymerization of the recited monomers in the presence of starch degradation products. The adhesive is useful for bonding a nonwoven substrate to a second substrate. At column 7, lines 13-25, the reference teaches that it may be desirable to add a surfactant to the adhesive "at conventional levels". The reference provides no reason for the addition, and no guidance on what defines "conventional levels", and no suggesting that the surfactants would migrate in the reference article, not that the surfactant would then impart a hydrophilic surface to the reference nonwoven substrate layer. Here, the Office Action relies on Applicant's own teachings of migratory surfactants to impermissibly make the rejection.

Claim 1 may be distinguished from Koubek et al. first in the limitation of a nonionic fluorochemical surfactant, which the Office Action notes is neither taught nor suggested by the reference. Further, there is no teaching or suggestion in the reference for the desirability of rendering the reference nonwoven substrate layer, or the second substrate layer, hydrophilic. The reference nonwoven substrates are described at column 7, lines 26 to 46. Some, such as the cellulose are naturally hydrophilic and would not be beneficially affected by a migratory surfactant, while others, such as the synthetic polymers are hydrophobic, and the use of a

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migratory surfactant to accomplish this is not contemplated by the reference. In making the rejection, the Examiner overlooks the burden required by M.P.E.P. 2143.01; that "the prior art must suggest the desirability of the claimed invention".

The Office Action avers that the deficiencies of Koubek et al. are provided by Temperante et al. Applicants disagree.

Temperante et al. is directed to hydrophilic, thermoplastic polymers in the form of fibers or films, the polymer mixture including one of more nonionic fluorochemical surfactants, and one or more non-fluorinated hydrophilic surfactants.

Were one to ignore the requirement that the teaching or suggestion of modifying the references come from the references themselves, and combine Koubek et al. with Temperante et al., as suggested in the Office Action, one would still not be in possession of Applicant's invention. Temperante et al. teach the addition of the recited surfactant to the molten thermoplastic polymer, as taught in reference column 8, lines 13 to 32. Thus, the reference polymers are rendered hydrophilic by direct addition to the melt, known in the art as "polymer melt additives". There is no teaching in Temperante et al. to add the reference surfactant mixture to an adhesive layer, as adhesives are not in the reference disclosure. The suggested combination would be the substitution of the hydrophilic polymers of Temperante et al., for the nonwoven substrate layer of Koubek et al. There is no basis in the references for making such a substitution, nor any motivation for doing so.

With regard to claims 10 to 12 the Office Action asserts "it would be obvious....to use the amount of surfactant having the amount in the range of the instant claimed invention motivated by the desired to render the surface of the polymeric substrate hydrophilic". Applicants disagree.

The Examiner is using Applicant's own disclosure to provide the requisite motivation as Koubek et al. do not teach or suggest the desirability. To the extent that Koubek et al. require a hydrophilic nonwoven substrate, the reference itself provides it in the form of cellulotics, which are naturally hydrophilic. Even if one were to make the impermissible combination with Temperante et al, the combination provides another source – the polymer melt additives in which the reference surfactant are added to the molten polymer. Further, while Temperante et al. teach the desirability of a hydrophilic top sheet in diaper construction, the hydrophilicity is imparted by

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the addition of the reference surfactant blend to the thermoplastic polymer, not from an adjacent adhesive layer.

Claim 12 specifically recites the adhesive comprises 5 to 40 wt.% of the fluorochemical surfactant, a range *outside* of the reference range. At Temperante column 8, lines 12 to 32 it teaches that the blend of fluorochemical and non-fluorinated surfactants comprise 0.2 to 5.0 % by weight of the thermoplastic polymer, and the ratio of the fluorochemical and non-fluorinated surfactants is 9:1 to 1:9. Therefore the amount of fluorochemical surfactant in Temperante et al. is 0.02 to 4.5 %, under the 5% lower limit of claim 12. The Office Action provides no reasoning for exceeding the range of the reference.

With respect to Mallya et al., the Office Action relies on an unduly broad generalization that "[I]t is well known that surfactants are migratory species that with time move towards and bloom to the surface of films also rendering them water sensitive".

A fair reading of the above text suggests that when a surfactant is incorporated into a polymer film, the surfactant will migrate to the surface of the film. There is no teaching or suggestion that the surfactant will cross the boundary or interface between the polymer film and an adjacent layer to render the adjacent layer hydrophilic. More specifically, there is no suggestion that a surfactant, incorporated into an adhesive layer (as opposed to a polymer film), will cross a boundary or interface between the adhesive layer and an adjacent thermoplastic polymer layer, as required by instant claim 1.

In addition, the statement of Mallya et al. is contradicted by the reference itself, where each example contains a mixture of surfactants, but does not yield "water-sensitive" films. The Examiner's attention is directed to Table II, bridging columns 15 to 20. Each of the examples contains at least one part of surfactant mixture per hundred parts polymer, yet are not "water sensitive". Applicants submit the cited text is mere hyperbole used by Mallya et al. to favorably distinguish the reference compositions.

In citing Mallya et al., the Office Action appears to be suggesting a rejection based on inherency. M.P.E.P. 2112 states:

"To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary

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skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing *may* result from a give set of circumstances is not sufficient.' " *In re Robertson*, 169 F.3d 743, 745 USPQ2d 1949, 1950-51 (Fed. Cir. 1999).

In the present Office Action, the rejections assumes that any surfactant added to an adhesive will inherently migrate to an adjacent polymer layer, and inherently render it hydrophilic. Applicants again submit the statement relied upon by the Examiner is directly contradicted by the same reference, as previously argued.

Applicants further argue that "water sensitivity" described by Mallya et al is not synonymous with hydrophilicity. Applicants have amended claim 1 to clarify the meaning of the term with the limitation that the polymer film exhibit a water contact angle of $< 90^\circ$. The term "water sensitive" as used by Mallya et al appears to mean "low resistance to whitening". This is further clarified at column 3, line 30-31 as "substantially unaffected by the action of hot and ambient temperature water". At column 4, lines 11 to 28, Mallya et al. provide a rationale for "water sensitivity":

It is believed in the art that the emulsion particles, on drying, form a film wherein the surfactant and other water soluble species, such as electrolytes, remain in the interstitial space between the particles. The interstitial space provides channels or pathways for the water molecules to diffuse into the polymer film. When water diffuses into the film, the refractive index between the polymer particles and the interstitial space becomes significantly different, leading to light scattering and coloration of the film. This is believed to cause the phenomenon known as "water whitening."

It was our initial intent to minimize the presence of water sensitive species and to compatibilize the water sensitive species present with the rest of the polymer and thereby prevent the formation of channels for diffusion of water into the polymer film. "Water sensitive" species include

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inorganic species such as potassium persulfate and the like and organic species such as surfactants and the like.

The "water-sensitivity" allegedly caused by surfactants is not synonymous with Applicant's limitation of "hydrophilic". The migration of surfactant, according to Mallya et al. would lead to whitening of the films. Further, this does not put one in possession of the further limitation that the instant articles exhibit a water contact angle of $< 90^\circ$. The fact that certain surfactants *may* migrate, and *may* impart a hydrophilic surface is not sufficient under the rules of M.P.E.P. 2112. It is further submitted that one skilled in the art would not necessarily accept the statement of Mallya, or recognize that hydrophilicity *would necessarily* be imparted by a migrating surfactant. One would further not be in possession of Applicant's class of fluorochemical surfactants based on a teaching of Mallya et al. or Koubek et al., or recognize the class *would necessarily* migrate to an adjacent polymer layer (and impart a hydrophilic surface thereto) based on the teachings of Temperante et al.

The rejection of claims 5-7 and 10-12 under 35 USC § 103(a) as being unpatentable over U.S. 5,532,300 (Koubek et al.) in view of U.S. 5,804,625 (Temperante et al.) has been overcome and should be withdrawn.

In view of the above, it is submitted that the application is in condition for allowance. Reconsideration of the application is requested. Allowance of claims 1, 2, 5-7, and 10 to 22, and 30, as amended, at an early date is solicited. Should claim 1 be allowed, Applicants request rejoinder of withdrawn claims 23-29 under the procedure of M.P.E.P. 821.04.

Respectfully submitted,

Date

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